

**REMARKS**

Entry of the foregoing, reexamination and reconsideration of the subject application are respectfully requested in light of the amendments above and the comments which follow.

As correctly noted in the Office Action Summary, claims 59-62, 66, 67 and 69-76 were pending. By the present response, claims 59, 60, 66, 69 and 70 have been amended, and claim 77 has been added. Thus, upon entry of the present response, claims 59-62, 66, 67 and 69-77 are pending and await further consideration on the merits.

Support for the foregoing amendments can be found, for example, in at least the following locations in the original disclosure: page 6, lines 30-37; page 10, lines 7-22; page 13, lines 6-12; page 18, lines 31-37; page 22, lines 4-11; page 27, lines 28-31; Examples 13-14; and the original claims.

***CLAIM REJECTIONS UNDER 35 U.S.C. §102***

Claims 69, 71 and 72 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,583,176 to Haberle (hereafter "*Haberle*") or U.S. Patent No. 5,587,421 to Weyland et al. (hereafter "*Weyland et al.*") or WO 97/23536 (hereafter "*WO '536*") on the grounds set forth in paragraph 3 of the Official Action.

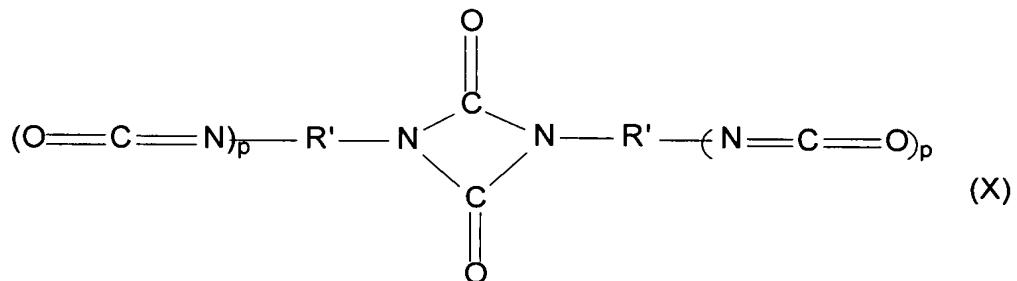
By the present response, claims 69, 71 and 72 have been amended such they now depend from claim 70. Claim 70 has not been rejected on the basis of *Haberle*, *Weyland et al.* or *WO '536*. Therefore, the above-noted grounds for rejection have been obviated.

Claims 66 and 69-76 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,461,135 to Malofsky et al. (hereafter "Malofsky et al.") on the grounds set forth in paragraph 4 of the Official Action. For at least the reasons noted below, this rejection should be withdrawn.

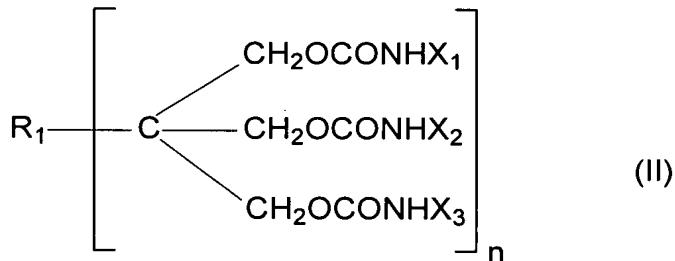
The present invention is directed to compounds, compositions, and methods for the preparation of low viscosity polyfunctional isocyanates from starting monomers. These compounds, compositions and methods are of interest, for example, in the paint and coatings industry. Benefits and advantages of the present invention include, without limitation, the production of appropriate viscosity substances, without necessity of utilizing large amounts of volatile solvents, and substances and techniques which do not rely on use of dimerization catalyst, thereby avoiding adverse colorization (see, e.g., page 2, line 11 - page 4, line 4).

A composition formulated according to the principles of the present invention set forth in amended claim 66. Claim 66 recites:

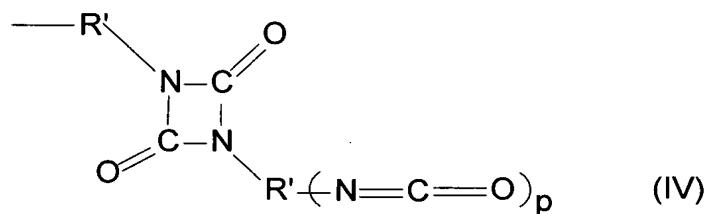
66. *A composition comprising at least one compound of general formula X:*



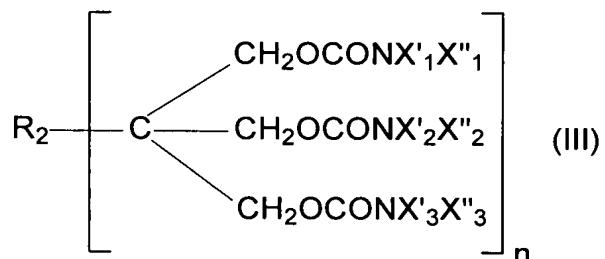
*in which R' is an aliphatic group and p is an integer ranging from 0 to 5, and at least one compound of general formula II:*



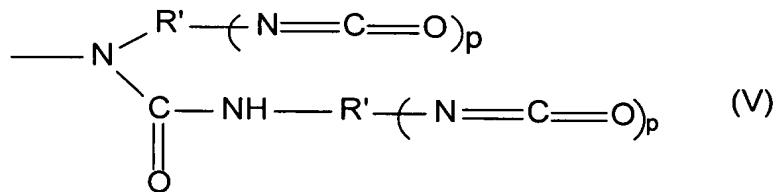
in which one or more of  $X_1$ ,  $X_2$  and  $X_3$  represents a group  $-R'(-N=C=O)_p$  and the others represent, a group



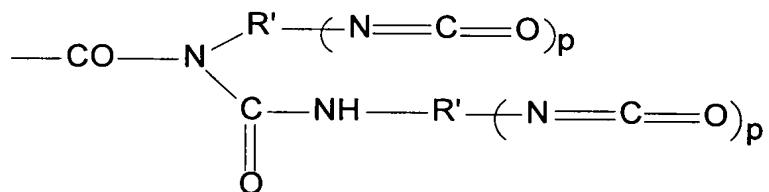
and  $R_1$  is a hydrocarbon group having 1 to 30 carbon atoms, in which the hydrocarbon chain optionally is interrupted by one or more chalcogen atoms and optionally bears 1 to 3 OH group, with the OH groups optionally substituted with a group  $CONX_1H$  wherein  $X_1$  represents  $R'(-N=C=O)_p$ , and  $n$  is an integer from 1 to 3; and/or at least one compound of general formula III:



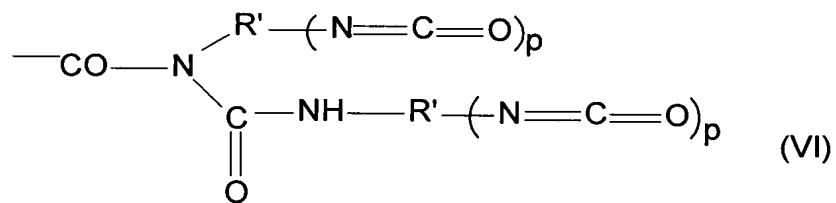
in which at least one of  $NX'_1X''_1$ ,  $NX'_2X''_2$  and  $NX'_3X''_3$  represents the group,



*the others representing a group  $\text{NX}_1\text{H}$  and  $\text{R}_2$  being a hydrocarbon group having 1 to 30 carbon atoms, in which the hydrocarbon chain optionally is interrupted by one or more chalcogen atoms and optionally, bears 1 to 3 OH groups, with the OH groups optionally substituted with a group  $\text{CONX}_1\text{H}$  or*



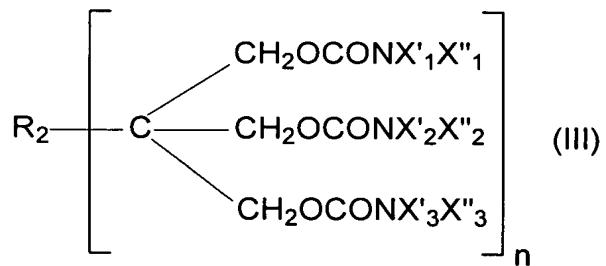
*and optionally a biuret compound containing an isocyanate group of general formula VI*



*said composition further comprising at least 1 weight % of at least one carbamate group and being free of dimerization catalyst selected from phosphine, aminopyridine, phosphoramide, organometallic or tertiary amine.*

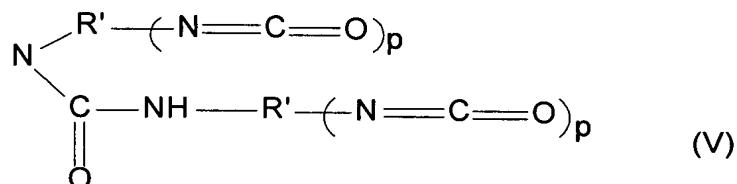
A compound formed according to further aspects of the present invention is set forth in amended claim 70. Amended claim 70 recites:

70. A compound comprising at least 1.0 weight % carbamate groups, the compound formed according to the formula III

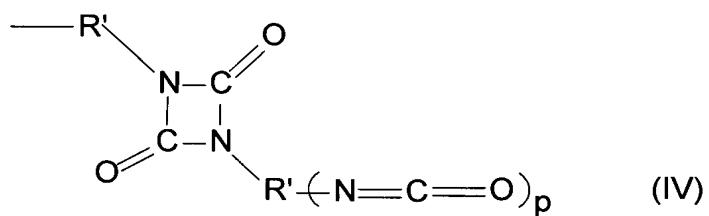


*in which:*

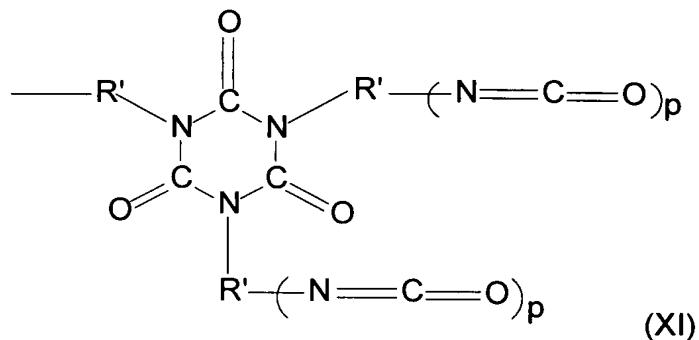
the groups  $NX'_1X''_1$ ,  $NX'_2X''_2$  and  $NX'_3X''_3$  are selected from a group of general formula  $NX_1H$ , with  $X_1$  representing a group  $R'$  ( $N=C=O$ ) $_p$ , in which  $R'$  is an aliphatic group and  $p$  is an integer from 0 to 5, or a group of general formula  $V$ ,



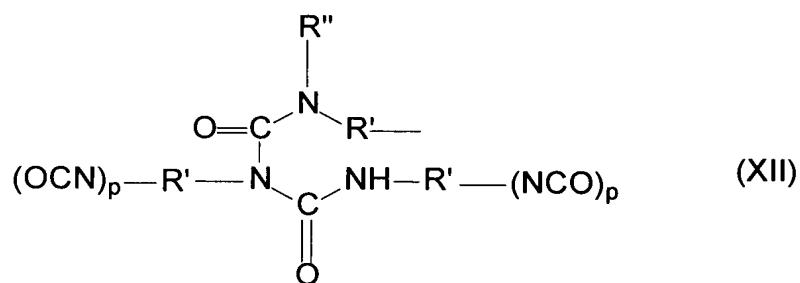
or a uretidinedione group of formula IV,



or an isocyanurate group of formula XI:



or, a biuret group of formula XII:



wherein  $R''$  represents  $H$  or a hydrocarbon group,  $R_2$  being a hydrocarbon group having 1 to 30 carbon atoms in which the hydrocarbon chain optionally is interrupted by one or more chalcogen atoms and optionally bears 1 to 3 OH groups and  $n$  is an integer ranging from 1 to 3, wherein the optional OH groups in  $R_2$  are optionally substituted with a group selected from  $\text{CONHX}_1$ , a group of formula VI, a group of formula IV, a group of formula XI or a group of formula XII, with the proviso that the compounds containing at least one group of formula  $\text{NX}_1\text{H}$ , or  $\text{CONX}_1\text{H}$  or group of formula V, also contain at least one group selected from a group of formula IV, group of formula XI, or group of formula XII, wherein formula VI is

The remaining claims depend either directly or indirectly upon claims 66 or 70. Thus, these claims are also not anticipated by *Malofsky et al.* for at least the same reasons noted above.

Finally, it is noted that in paragraph 4 of the Official Action, it is asserted that:

In view of the disclosed low degree of dimerization conversion at the point that the polyalcohol component is added, the position is taken that compounds that correspond to formulas X, II, and III, and mixtures of these compounds inherently result from the disclosed process.

Applicants state for the record that they traverse the assertion noted above regarding the inherency of these undisclosed aspects in the *Malofsky et al.* disclosure.

### ***CLAIM REJECTIONS UNDER 35 U.S.C. §103***

Claim 67 stands rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,461,135 to Malofsky et al. (hereafter "*Malofsky et al.*") on the grounds set forth in paragraph 5 of the Official Action. For at least the reasons noted below, this rejection should be withdrawn.

While acknowledging the absence of certain claimed aspects of the present invention and the explicit disclosure of *Malofsky et al.*, and the lack of a complimentary teaching cited in the prior art, it is nonetheless asserted that "it would have been obvious to one of ordinary skill in the art to incorporate isocyanurate or biuret trimers into the composition for their art recognized function of reducing viscosity." First, applicants respectfully traverse the assertion quoted above, which is not supported by the citation of any appropriate prior art references. Applicants respectfully request that should the rejection be maintained, an objective teaching be

identified in the prior art to support the above-quoted assertion. Second, the obviousness rejection set forth above is based on the same assertion of an inherency set forth in paragraph 4 of the Official Action with respect to the anticipation rejection described above. Applicants again traverse the assertion that "a position is taken that compounds that correspond to formulas X, II, and III, and mixtures of these compounds result from the disclosed process."

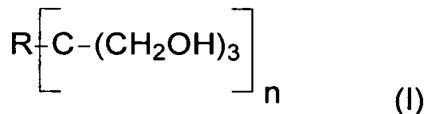
Nevertheless, because *Malofsky et al.* fails to disclose, or even suggest, the composition defined by claim 66, including the presence of at least 1 weight % of at least one carbamate group, *Malofsky et al.* also fails to render obvious the requirements of claim 67. Reconsideration and withdrawal of the rejection is respectfully requested.

Claims 59-62 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Malofsky et al.* in view of U.S. Patent No. 4,044,171 to Müller (hereafter "*Müller et al.*") on the grounds set forth in paragraph 6 of the Official Action.

In addition to the composition and compound set forth in claims 66 and 70, the present invention is also directed to a process, such as defined in claim 59.

Claim 59 recites:

59. *A process for the preparation of a low-viscosity (poly)isocyanate composition comprising at least one isocyanate dimer containing a uretidinedione unit and at least 1 weight % of at least one carbamate function, from starting isocyanate monomers in which the isocyanate groups are borne by sp<sup>3</sup> carbon atoms, comprising the step of heating a starting reaction medium comprising said isocyanate monomers, in the absence of a dimerization catalyst, to a temperature of at least 50°C and of not more than 200°C for a period of not more than 24 hours, the reaction medium containing the starting monomers also containing a compound of general formula I:*



*in which R is a mono- or n-valent hydrocarbon group having from 1 to 30 carbon atoms, in which the hydrocarbon chain optionally is interrupted by one or more chalcogen atoms and optionally, bears 1 to 3 OH groups, and n is an integer ranging from 1 to 3, said composition optionally containing products derived from reaction of said compound of formula I with a compound bearing an aliphatic isocyanate function.*

As readily apparent from the above, claim 59 requires, *inter alia*: "A process for the preparation of a low-viscosity (poly)isocyanate composition comprising at least one isocyanate dimer containing a uretidimedione unit and at least 1 weight % of at least one carbamate function . . . ."

However, for at least the same reasons explained above, *Malofsky et al.* fails to disclose, or even suggest, the process of producing the low viscosity carbamate-containing polyisocyanate composition of claim 59.

It is asserted in paragraph 6 of the Official Action that *Müller et al.* teaches that the dimerization of polyisocyanates may be performed in the absence of the catalyst by heating the temperatures of 120°C to 150°C. All applicants do not agree that the combined teachings of *Malofsky et al.* and *Müller et al.* would have necessarily suggested the claimed catalyst-free process, nonetheless, even if one of ordinary skill in the art would have applied the teachings of *Müller et al.* in the manner suggested in the grounds for rejection set forth in paragraph 7 of the Official Action, the claimed invention would not result. Namely, *Müller et al.* fails to cure the deficiencies previously set forth above in connection with the teachings of *Malofsky*

*et al.* Therefore, reconsideration and withdrawal of the rejection is respectfully requested.

The remaining claims depend either directly or indirectly upon claim 59. Thus, these claims are also distinguishable over the proposed combination of *Malofsky et al.* and *Müller et al.* for at least the same reasons noted above.

### **CONCLUSION**

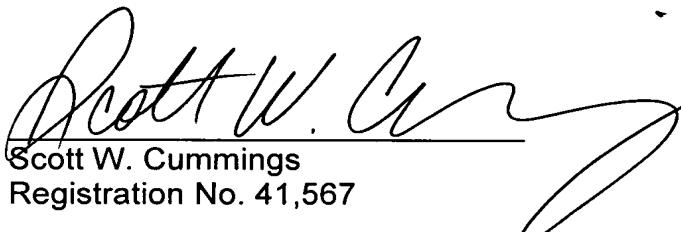
From the foregoing, further and favorable action in the form of a Notice of Allowance is earnestly solicited. Should the Examiner feel that any issues remain, it is requested that the undersigned be contacted so that any such issues may be adequately addressed and prosecution of the instant application expedited.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

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